

Scale-Up: FIRST Tech Challenge

Overview: FIRST Tech Challenge (FTC) is a community-focused robotics program while teaching students the value of hard work, innovation and creativity while going beyond the robotics competition by teaching teenagers the importance of working together, sharing ideas and treating each other with respect and dignity.

Program Summary

FIRST Tech Challenge (FTC) is a mid-level robotics program designed to inspire and increase the interest of young people (ages 12-18) into STEM fields. FTC offers students the opportunity to: design, build and program robots; build experience and confidence with complex STEM-based concepts; document the engineering design process; develop problem-solving and team-building skills; enhance their public speaking skills, and; compete and cooperate in alliances during tournaments. Additionally, FTC enables high-school students, including those traditionally underrepresented in the STEM fields, to solve real-world challenges and offers a life-changing experience to help students realize a STEM career is feasible. For nearly five years, The University of Iowa College of Engineering has served as the Affiliate Partner for the FTC program in Iowa. The FTC program in Iowa has received continual support from Rockwell Collins.

Project Description/Objectives

- Increase the number of students who are engaged in a hands-on, team-based, STEM program. FTC students have the opportunity to engage with STEM concepts, including: programming; physics; trigonometry; programming algorithms; calculus, etc. FTC is more than the robot, students also apply critical life skills:
- Gracious Professionalism, effective communication, teamwork, etc.
- Increase the number of formal (schools) and informal groups (extension clubs, non-profit organizations, Boys/Girls Clubs etc.) who offer FTC to the students of their community.
- Increase the number of community partners involved with FTC. This includes the encouragement of local businesses to have employees serve as to be team mentors or as volunteers at local and regional events.
- Community partnerships increase team sustainability, allows businesses to give-back to local labor force.
- Empower FTC teams to host local events. Regardless of where a team is located, by providing sufficient equipment and training, team will be able to host local competition events for teams in their area.
- Educate the FTC coaches and mentors through different Professional Development opportunities. Through education, coaches and mentors have a higher likelihood of program sustainability for several years.

Grade Levels: 7-12

What is Provided by the Project

FTC is for students in grades 7-12 and teams of up to 15 students. The actual size of the team depends on the preferences of the coach. Through support from Rockwell Collins, new FTC teams will receive the FTC kit-of-parts and the licenses to the software platforms. The FTC kit-of parts is reusable for several seasons. Through the STEM Scale-Up, teams will receive equipment beyond the robot kit-of-parts. This equipment includes a laptop, reusable field equipment, consumable field equipment and required electrical components for hosting an event.

Two professional developments will be offered to FTC coaches, in which one PD is required for all coaches to attend. The FTC coaches and mentors will have access to periodic newsletters from the FTC-Iowa program and monthly emails from the FIRST program. FTC students, mentors, and coaches will also have access to resources provided by FIRST, including a 24/7 competition & rule forum in which they can post questions and receive answers from the game designers. They will also have access to the local FTC website, the national FIRST website, and have access to monthly Google+ Hangouts sponsored by FIRST. And finally, students who participate in FTC can also qualify for college scholarships. These scholarship awards range from \$500 to full four-year tuition.

What is Required by the School or Local Education Agency (LEA) in Order to Implement This Program:

- August 2014: Service provider will coordinate the logistics and finalize agreements with LEAs.
- September 2014: The FTC Game is revealed and the build season begins. Teams establish regular meeting time.
- October 2014: Teams meet regularly. Coaches attend professional development to receive tournament materials.
- November 2014-December 2014: Local tournaments take place in each region. Meets consist of teams within a 100 mile radius, be 4 hours in, and at any of the participating organizations. Teams compete in at least 3 meets.
- January 2015-February 2015: Regional tournaments occur. Teams will advance from meets to the district. These events will have a limited capacity and will be at locations in the regions.
- February 2015: Teams advance from district and will be invited to compete at the FTC-Iowa Championship.
- March 2015: LEA assessment and LEA reimbursement.

Website to View Program and Standards Alignment: <https://www.engineering.uiowa.edu/ess/ftc-standards-alignment>

Program Video: <http://youtu.be/XULHBkAJUXs>